Adak Island UPDATE

Health Advisory and PCB Levels in Rock Sole and Blue Mussels

Naval Facilities Engineering Command Northwest

Naval Facilities Engineering Command

January 2006

Background

From 1999 through 2005, the Navy has been sampling one type of fish, rock sole, and one type of shellfish, blue mussel, in Adak's Sweeper Cove and Kuluk Bay. The purpose of this sampling is to see how much of a certain toxic chemical (polychlorinated biphenyls, or PCBs) these fish and shellfish contain. Rock sole and blue mussels were selected for evaluation because they are readily available sources of seafood at Adak. Rock sole and blue mussels were found to contain higher-than-normal levels of PCBs. This work is being conducted as part of the cleanup actions at Adak Island under the Superfund law. The Navy has worked with the State of Alaska Department of Environmental Conservation (ADEC) and the U.S. Environmental Protection Agency (EPA) to advise Adak residents to limit their intake of rock sole and blue mussels from Sweeper Cove and Kuluk Bay.

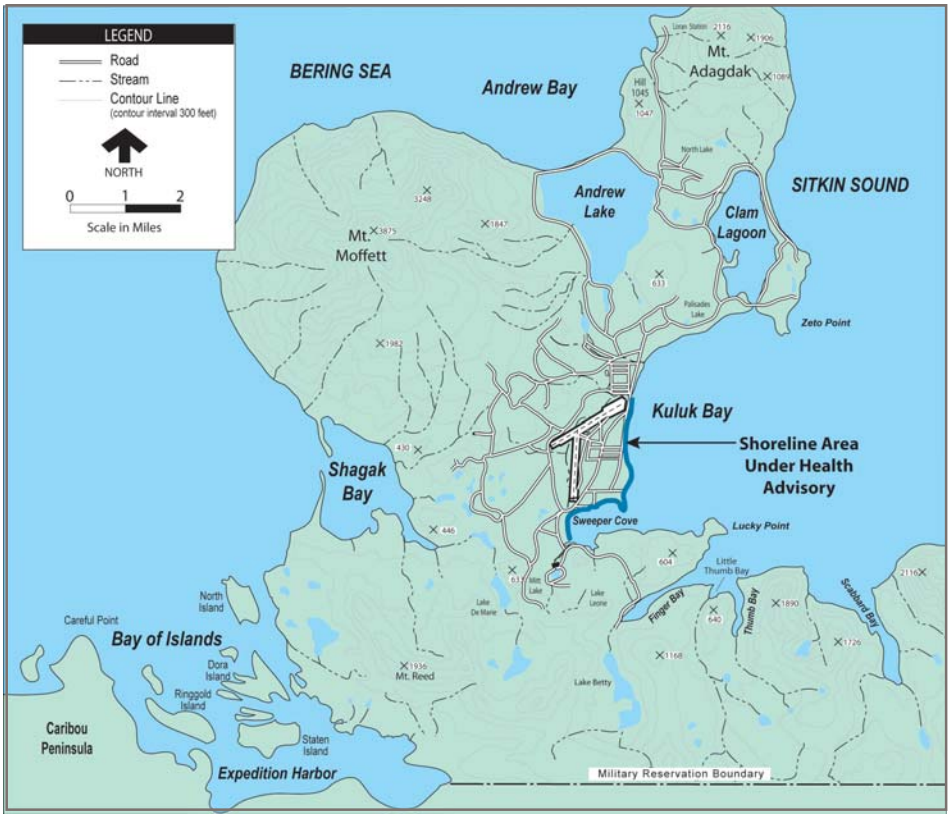
The sampling of rock sole and blue mussels meets the marine monitoring requirements of the Record of Decision (ROD) for Operable Unit A (OU A) at the former Naval Air Facility Adak. The ROD required that the level of PCBs in rock sole and blue mussels be monitored for a minimum of 5 years. After evaluating the 5 years of monitoring results in 2003, the Navy, in consultation with ADEC and EPA, determined that sampling every other year was appropriate through 2009. The ROD set a PCB concentration of 6.5 parts per billion (ppb) as an "action level" for rock sole. The action level for blue mussels was set at 31 ppb.

This fact sheet describes the results of the sampling of rock sole and blue mussels from 1999 through 2005 and summarizes the current fish and shellfish health advisory. It also identifies the need for continued monitoring of PCB levels in these two species.

Figure 1 shows the locations of Kuluk Bay and Sweeper Cove where the samples of rock sole and blue mussels were collected and the shoreline area under the health advisory described on page 4 of this fact sheet. From 1999 through 2005, rock sole and blue mussels were collected from Kuluk Bay and Sweeper Cove. Rock sole were collected with bottom nets from a fishing boat. Blue mussels were collected by hand along the shoreline.

In 1999, the Navy finished its cleanup of areas on Adak Island that were thought to have been the sources of PCB contamination for Sweeper Cove and Kuluk Bay. Without PCB sources on land to release PCBs to these water bodies, PCB levels in rock sole, blue mussels, and other fish and shellfish are expected to slowly decrease over time.

Figure 1. *Area Under Health Advisory*



PCB Levels in Rock Sole

As expected, the highest PCB levels in rock sole were found in Sweeper Cove, which is the closest monitored area to the former PCB sources on Adak Island. All known PCB sources have been removed, so sediment that enters Sweeper Cove and Kuluk Bay from the shore should be relatively "clean." PCBs in the fish are expected to decrease as clean sediment covers the existing sediment, and new generations of rock sole inhabit the area.

Average PCB levels in rock sole from Sweeper Cove range from about 19.5 to 96 ppb (Figure 2) between 1999 and 2005 and are above the action level of 6.5 ppb. The average has increased each year until 2005 when the average PCB level decreased to 19.5 ppb. It is unclear why the average PCB level in rock sole decreased significantly from 2003 to 2005. It could be variation that is inherent in geographic and temporal data of this kind.

Average PCB levels in Kuluk Bay rock sole range from about 5 to 14 ppb. Figure 2 shows that average PCB levels in Kuluk Bay rock sole are close to the action level. PCB levels also decreased in Kuluk Bay rock sole from 2003 to 2005, but remain slightly above the action level.

PCB Levels in Blue Mussel

The highest PCB levels in blue mussels were found also in Sweeper Cove. Average PCB levels in blue mussels in Sweeper Cove range from about 24 to 133 ppb from 1999 to 2005. Figure 3 shows that PCB levels in blue mussels from this area have been close to the action level of 31 ppb in 1999, 2001, 2002, and 2003. In 2005, the average PCB level was 133 ppb. This highest average level resulted from levels found at location 28 where nearby sediment was disturbed during construction at the small boat harbor. If PCB levels in mussels from that location were excluded, the average PCB level for 2005 would be about 46 ppb and much closer to the action level (Figure 3).

Average PCBs in Kuluk Bay blue mussels range from about 4 to 32 ppb. The highest level was detected in 2005. Average concentrations more than doubled from 2003 to 2005. The 2005 PCB level of 32 ppb slightly exceeded the action level. It is unclear why the average PCB level in blue mussels increased from 2003 to 2005. It could represent inherent variation in the data.

Health Advisory and Future Monitoring

Currently, the health advisory for Adak fish consumption includes rock sole caught in Sweeper Cove and Kuluk Bay and blue mussels gathered in Sweeper Cove. The shoreline area affected by this advisory is shown in Figure 1. The advisory for blue mussels collected in Kuluk Bay was removed in 2003 because average PCB levels were significantly below the action level prior to 2005. Although the 2005 average PCB level in Kuluk Bay blue mussels slightly exceeded the action level in 2005, ADEC, EPA, and the Navy determined that the sampling results from 2007 should be evaluated before a change in the advisory is considered.

The Navy plans to test rock sole and blue mussel from Sweeper Cove and Kuluk Bay in 2007 and 2009. Future monitoring will help establish increasing or decreasing trends in the PCB levels with better certainty.

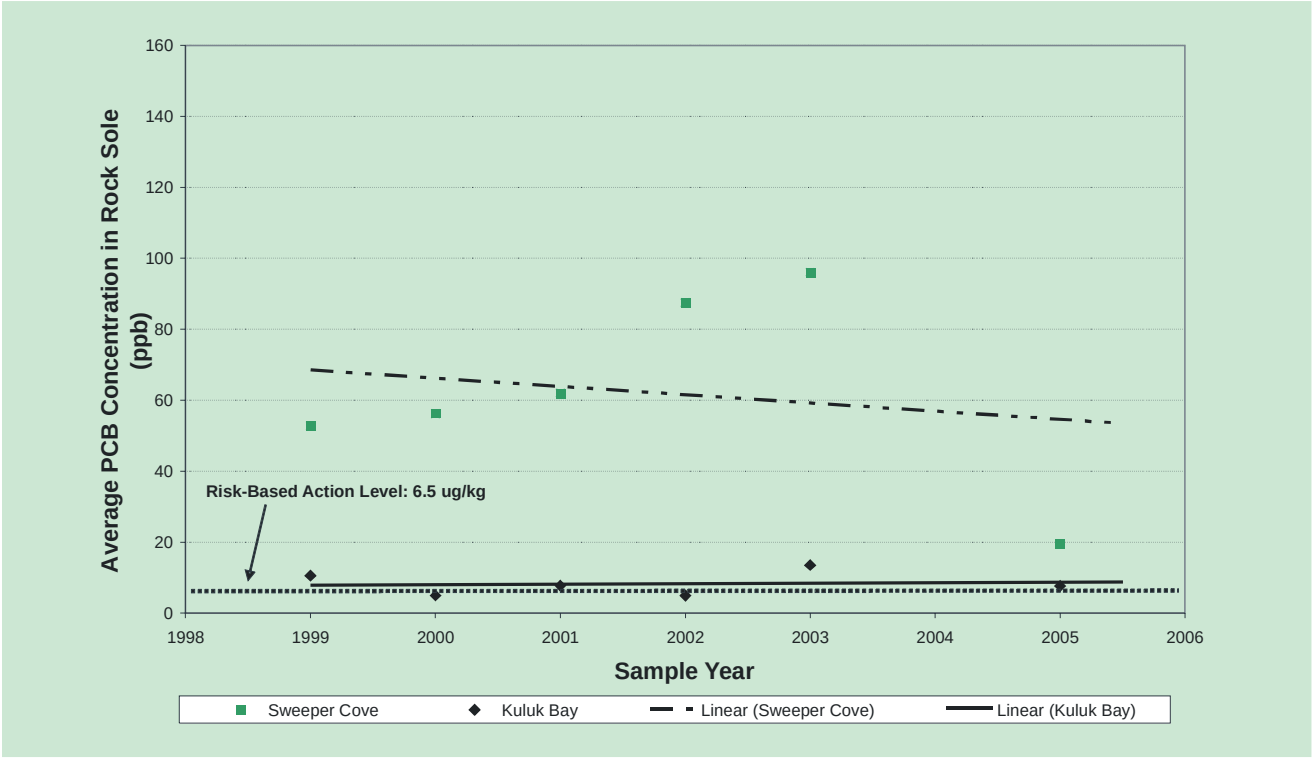
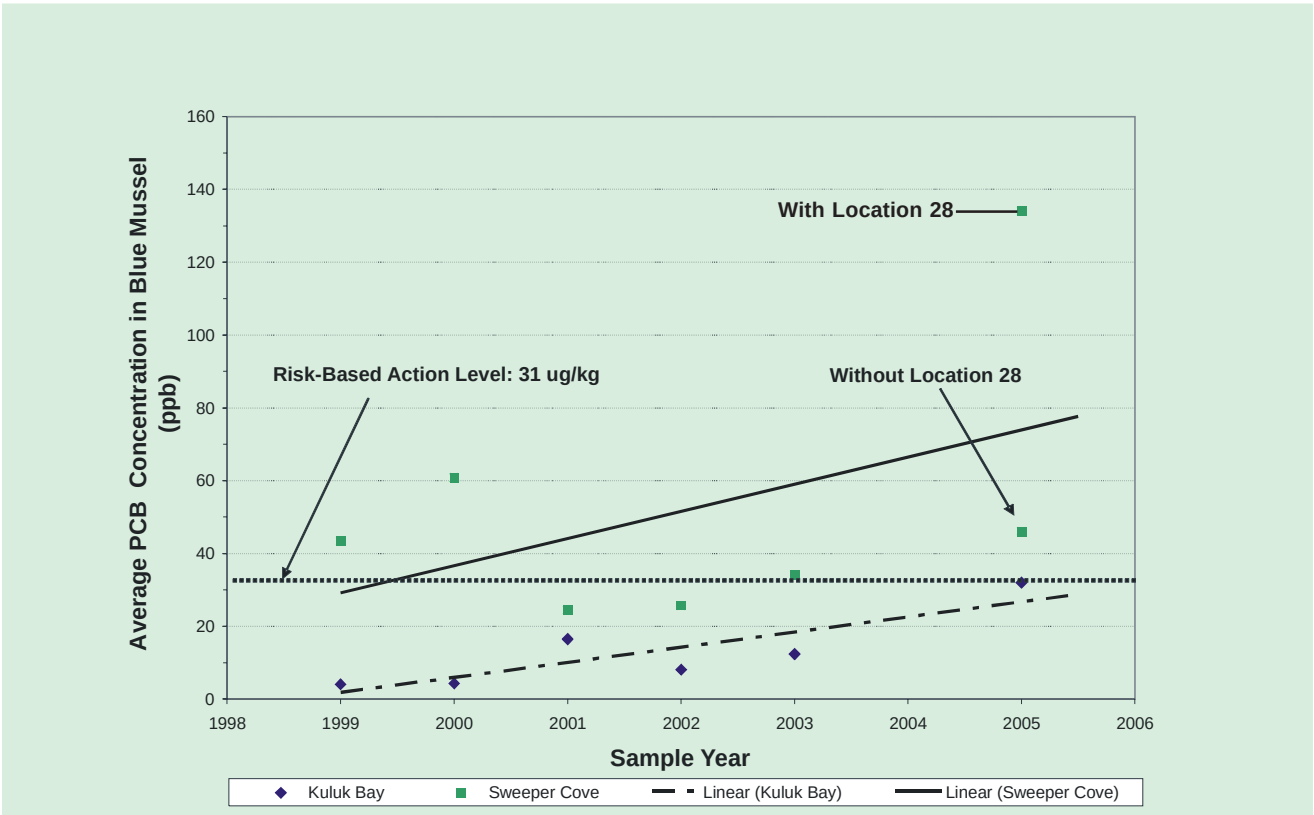


Figure 2. *Average PCB Levels in Rock Sole from Sweeper Cove and Kuluk Bay Since 1999, with Trend Lines Shown*



Note: The trend line for Sweeper Cove includes location 28.

Figure 3. *Average PCB Levels in Blue Mussels from Sweeper Cove and Kuluk Bay Since 1999, with Trend Lines Shown*

Table 1
Suggested Fillet/Mussel Meal Limits

Species	Recommendation
Sweeper Cove	
Rock Sole	Two meals per week
Blue Mussel	Two meals per week
Kuluk Bay	
Rock Sole	Two meals per week

Note: One meal equals 8-ounces of fish or shellfish for the average adult. *Meal sizes are assumed to be less for children.*

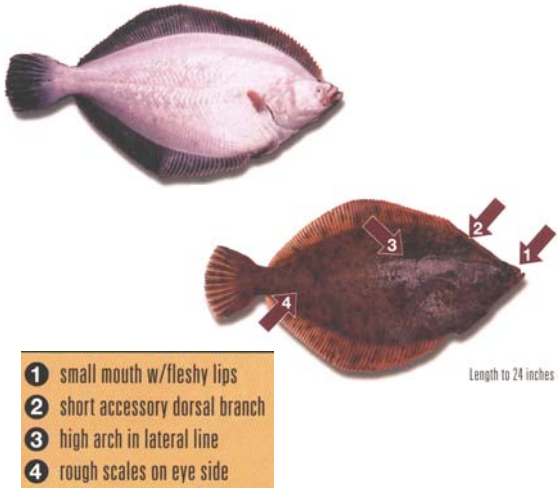


Figure 4. *Rock Sole*

Figure 5. *Blue Mussels*

Health Advisory Update for Adak Fish Consumption

To protect public health, EPA guidance was used to establish suggested limits on the amount of rock sole from Sweeper Cove and Kuluk Bay and blue mussels from Sweeper Cove. **See Table 1.**

This information is not intended to discourage you from including fish in your diet, which is a good source of low-fat protein and essential fatty acids.

A diet that includes fish every week can help lower your risk for heart disease. Use this advisory as a guide to help you plan which locally caught fish to keep, as well as how often and how much to eat.

You should also be aware that this advisory is limited to consumption of rock sole (Figure 4) from Kuluk Bay and Sweeper Cove and blue mussel (Figure 5) from Sweeper Cove. The advisory does not apply to other species of fish, such as salmon or halibut caught in these or other waters around Adak. Alaska's Division of Public Health is not associated with this advisory and currently places no restrictions on consumption of fish or shellfish statewide.

Important Health Messages

- Suggested limits for the amount of rock sole and blue mussels that can be safely eaten have been set for Sweeper Cove and Kuluk Bay. See Table 1.
- Pregnant women, women considering pregnancy and children through six years of age should carefully follow the meal limits given in Table 1.

Animal Studies have shown that PCBs affect the reproductive and immune systems, liver and thyroid. PCBs are considered probable human carcinogens. All adults and children should observe the meal limits given in Table 1.

The advised fillet/mussel meal limits given in Table 1 are considered protective of all adults (including pregnant women) and children.

All fish meals should be prepared as fillets because whole fish have higher levels of PCBs.

Its okay to eat different fish species but do not combine meal limits for each species. For example, each week you can have two sole **or** two mussel meals. Adults (other than pregnant women and women considering pregnancy) and children can eat more per month if they do not exceed the total that would be allowed in a year. For example, 104 rock sole meals could be eaten during the summer fishing months provided you do not eat any more sole or mussel meals for the rest of that year.

For additional information about health issues related to Adak fish/shellfish consumption, please visit the Adak information repository, on the second floor of the High School.

Adak Island UPDATE

Health Advisory and PCB Levels in Rock Sole and Blue Mussels

Naval Facilities Engineering Command Northwest

NAVFAC Naval Facilities Engineering Command

Naval Facilities Engineering Command Northwest
19917 Seventh Ave., NE
Poulsbo, WA 98370